

BACKGROUND AND FREQUENTLY ASKED QUESTIONS WASTE TO ENERGY FACILITY

Rappahannock Regional Solid Waste Management Board Stafford County/City of Fredericksburg

(Revised August 9, 2013)

Background

The Rappahannock Regional Solid Waste Management Board (R-Board) was established in 1987 to serve the residents of Stafford County and the City of Fredericksburg with solid waste services. It currently operates a sanitary landfill on approximately 800 acres off of Eskimo Hill Road. It provides landfill service for municipal solid waste to residents of Stafford County and the City of Fredericksburg either via commercial haulers, or who wish to personally drop waste off at the Eskimo Hill Road site or at the drop off at Belman Road in the City. The R-Board also operates collection sites for recyclable materials, and receives other materials such as yard waste, construction and demolition debris, and used tires for final disposition.

The landfill receives a total of approximately 135,000 tons per year of assorted waste materials, and has an approved budget of \$4,835,000 for fiscal year 2014. Revenues to sustain this operation come primarily from commercial tipping fees, which are projected to generate \$3,200,000 this fiscal year. Recycling revenues are projected at \$405,000 this year. Stafford and Fredericksburg residents are allowed to bring their waste to either the landfill or Belman site at no charge.

The landfill currently holds an E3 (Exemplary Environmental Enterprise), Level 3 certification from the Virginia Environmental Excellence Program. Only four other landfills, located in Spotsylvania, Hampton, Bristol, and Charles City County, have this designation.

The Rappahannock Regional Solid Waste Management Board (R-Board) has proven receptive to innovative ideas to efficiently manage the disposal of the municipal solid waste (MSW) generated by the communities we serve, while at the same time helping the environment. One such example of this commitment is the methane gas to electricity facility at the R-Board's Eskimo Hill site. Opened in 2008, this facility generates 2.14 megawatts of electricity from the methane gas generated by the landfill, which is enough to power up to 1,300 homes each day.

The R-Board is currently considering another project that will produce energy from the MSW that is disposed at the Eskimo Hill site. In 2012, the R-Board solicited proposals from firms interested in constructing an innovative energy production facility using the MSW delivered to the landfill at Eskimo Hill Road. The R-Board had recently completed construction of a new location to receive MSW (Cell F), with a projected 3-year operational life, and the construction of a facility capable of converting MSW into energy would greatly extend the life of the new cell.

In November 2012, the R-Board received 3 proposals – 1 proposer subsequently withdrew from consideration – for evaluation. Following extensive examination of the 3 proposals, including interviews with each, the R-Board determined that the proposal from Energy Extraction Partners, LLC

(EEP) was in the best interest of the residents served by the landfill. The principal advantages identified in this proposal are as follows:

- The R-Board receives an average of 135,000 tons of MSW per year, not including recyclable materials which are sorted out prior to weighing. The 135,000 tons of waste are buried within the sanitary landfill. A waste to energy (WtE) facility would convert approximately 85% of this waste material into useable electrical power, rather than burying it.
- The 85% reduction in landfill activities would significantly reduce operating expenses for labor and equipment, as well as maintenance expenses necessary to keep the equipment operational.
- The agreement allows the R-Board to continue to receive all user (tipping) fees currently collected by our operations.
- The reduction in landfilling volumes could extend the life of the new cell from 3 years to 18 years, realizing another substantial savings in operational costs.
- The proposal represents a private investment of over \$65 million, along with a staff of about 60 employees.

Following negotiations, the R-Board entered into an agreement with EEP to construct a WtE facility on approximately 10 acres of leased property operated by the R-Board at the Eskimo Hill Road landfill site.

Key operational elements of the agreement are as follows:

- Construction of a waste to energy facility capable of producing 15 megawatts electric (MWE) on property operated by the R-Board at the Eskimo Hill Road location.
- The agreement will be effective for 20 years and may be renewed if agreed to by both parties.
- The facility is to be constructed at the expense of EEP. No City, County or R-Board funds are to be applied towards the construction or operation of the facility.
- EEP is responsible for obtaining all air quality and solid waste permits necessary for the construction and operation of the facility.
- EEP is responsible for operating the facility in compliance with all permits issued for the facility.
- EEP is responsible for obtaining local site plan approval.
- The R-Board will provide all MSW received from its operations to the WtE facility.
- The R-Board will keep the tipping fees received from commercial MSW collection services.
- The R-Board will continue current recycling operations, along with the associated revenues.
- The R-Board will accept materials separated from the MSW determined to be unacceptable for processing through the WtE facility, and allow them to be placed in the landfill.

Key financial elements of the agreement are noted below:

- EEP will make a \$1 million advance payment to the R-Board.
- EEP will make an additional \$1 million payment to the R-Board if the facility is determined to qualify for federal energy tax credits.
- EEP will make a \$100,000 lease payment each year to the R-Board.

The property upon which the R-Board operates the landfill is jointly owned by Stafford County and the City of Fredericksburg. Each locality must approve the lease of property, and a public hearing is required prior to action. Stafford County completed this process in June 2013. The City of Fredericksburg is scheduled for final action in August 2013.

Pending approval of a lease by both jurisdictions, and subsequent agreement of the lease terms and execution of the lease by all parties, EEP will proceed with the design, permitting and operation of the WtE.

Frequently Asked Questions

1. What facility is proposed for construction at the R-Board site on Eskimo Hill Road? A firm, Energy Extraction Partners, LLC, is proposing to construct and operate a 15 megawatt electric (MWE) facility. The facility will process all the municipal solid waste (MSW) received at the landfill, along with waste tires, and convert this to a combustible gas capable of powering electrical turbines. The power produced will be sold to Dominion Virginia Power for distribution to customers.
2. Can you put 15 MWE in perspective? For example, how many homes can 15 megawatts provide power for? Using conventional calculations of between 1,000 to 1,300 watts per home, the facility can serve up to approximately 15,000 homes.
3. How will this affect the environment? When permitted by the Department of Environmental Quality (DEQ), the proposed project will take the MSW coming into the landfill and divert it for conversion into electricity. The electricity will be produced in a controlled, highly monitored and regulated operation, in a factory like setting. This operation allows the installation of state of the art air pollution control equipment on the few discharge locations, ensuring an air discharge that meets the highest air quality standards. In addition, when placed in operation, the facility will reduce the methane gas produced when MSW is buried.
4. Who is EEP? What are the names of the companies involved in the WtE facility? Energy Extraction Partners, LLC is the name of the business entity formed to construct and operate the WtE facility in Stafford County. The LLC is comprised of WIT LLC, BB Energy 1 LLC, Creative Energy Systems S-Corp and Energy Funding Partners LLC. The main suppliers included with EEP are Creative Energy Systems Corporation (CES), Combustion Associates, Inc. (CAI), and American Combustion Technologies, Inc. (ACTI).
5. What other WtE facilities does CES have? They are currently working through the approval process for a similar facility in La Junta, Colorado, but the process is further along with Stafford.
6. What are the main components of the proposed WtE facility? The facility proposed for Stafford County consists of 4 main operational areas: intake/separation/pre-processing; pyrolysis; power generation; and byproducts handling. A description of each is as follows:
Intake/separation/pre-processing: Trucks loaded with MSW are directed to the WtE facility to discharge their loads inside the 120,000 square foot all enclosed facility. The material is segregated and those materials not suitable for processing (concrete, metals, etc.) are directed into recycling for revenue, or to the landfill for burial. Material suitable for synthetic gas production (syngas) are subjected to a 2-stage shredding and conditioning process, dried and converted into stabilized fuel “cubes”, which are resistant to decay, provide a consistent fuel quality, and are easily handled. When converted, the cubes become refuse derived fuel (RDF).

Pyrolysis: Once the fuel source is properly conditioned, it is fed into the pyrolysis unit where it is baked in an oxygen starved environment at temperatures up to 1,500 degrees Fahrenheit to break the feedstock into syngas and byproducts. The material is not burned, or exposed to direct contact with flames. The controlled combustion and low oxygen environment reduce emissions.

Electrical production: the syngas is compressed and stored to be used as fuel to power the turbines which produce the electricity. The turbines feed electricity into the Dominion Virginia Power grid in the vicinity of Eskimo Hill Road.

Byproducts processing: There are 2 byproducts from pyrolysis; ash and a tar-like residue. Both products have market potential as cement additive, soil amendment, etc. If no market is financially feasible, these products could be directed to the landfill, provided the solid waste permit is modified accordingly. We understand that identifying a market destination for these byproducts is a high priority for EEP.

7. **Why use pyrolysis?** Pyrolysis is often considered for locations where the landfill tonnage is lower. This is due to the extensive pre-screening used in pyrolysis to assure the valuable recyclables are removed, and the feedstock is properly screened, shredded, and dried before being fed to the pyrolysis unit. For applications with higher tonnage, the cost for the pre-screening operation becomes prohibitive.
8. **Where will the MSW come from?** The MSW for this facility will come only from Stafford County and the City of Fredericksburg. No outside MSW is proposed or permitted. It is expected that on average, 3 to 5 truckloads per day of waste tires collected in Virginia will be brought in for the operation of this facility. A maximum of 10 truckloads are allowed per day, if there is an interruption in the delivery of MSW to the facility.
9. **Has this type of facility been tested anywhere else in the U.S.?** The main component in the process – the pyrolysis unit – has been tested by the Department of Energy during an environmental assessment and found to capable of meeting very restrictive emission standards. There is an operational unit rated at 5 tons per day per unit processing sewage running in Los Angeles, California and producing diesel fuel for the U.S. Navy. This unit is identical in geometry to those proposed for Stafford, although the Stafford facility is proposed to have 4 total units. Testing at the California facility is planned to provide data for the operation and air quality for facility in Stafford.
10. **Is this technology in operation elsewhere in the world?** Yes, pyrolysis units are in operation in Europe and the Far East. Attached to the end of the FAQ's is a list of similar facilities in operation worldwide. The list was compiled by the Department of Energy in conjunction with the National Environmental Policy Act (NEPA) documentation prepared in support of a facility proposed for Green Bay, Wisconsin. The report was completed in 2011, and additional facilities have been placed in service since then.
The particular unit under consideration in Stafford is manufactured in California. The waste segregation and preprocessing units are also in operation around the world.
Gas turbine electrical generation is quite common in the United States; in fact, 2 such turbines operating at 1 MWE each are in operation at the landfill. They run on methane gas recovered from the previously closed landfill cells.
11. **What permits are required to construct and operate a WtE facility?** The Commonwealth of Virginia – through the Department of Environmental Quality (DEQ) – will permit this facility for

both MSW handling and air quality. The landfill currently operates under a solid waste permit and an air quality permit. These permits would be modified, but remain in place, while EEP would obtain new permits for their operation. EEP will be required to perform tests and analysis to demonstrate that the facility can meet stringent air pollution requirements.

12. Has a facility similar to this ever had a thorough environmental review and received a construction permit with air quality limits? Yes. The Oneida facility proposed for Green Bay, Wisconsin, underwent a thorough Environmental Assessment as part of the National Environmental Policy Act (NEPA) process. The facility received a Finding of No Significant Impact (FONSI) based on this study. This facility also received an air pollution control construction permit from the Wisconsin Department of Natural Resources. The links to these documents are as follows:

DOE Environmental Assessment: <http://energy.gov/nepa/downloads/ea-1862-final-environmental-assessment>

Wisconsin Air Permit: <http://www.osgc.net/pdf/wisconsin-dnr-air-permit-090911.pdf>

13. Will there be equipment installed to reduce or eliminate air pollution? Yes. Even though the discharge from a pyrolysis unit is far less than incineration, a scrubber is required to assure compliance. There are multiple discharge points in the process from the preprocessing dryer, the pyrolysis unit, and the exhaust from the turbines. Each of these points will be monitored by DEQ for compliance. The allowable concentrations, frequency of testing, and reporting requirements will be established by DEQ during the development of the permit requirements.
14. Will dioxins be released from this facility? There has been no test data for this specific proposed facility provided to DEQ for analysis, so any specific discussion of permit limits is premature. We are aware that an incineration facility converting waste to energy in Fairfax County has a dioxin discharge limit of 0.005 pounds per year (lbs/yr). It is highly likely that the proposed facility in Stafford, using pyrolysis and approximately one-tenth the size of the Fairfax facility, will have a dioxin limit below 0.005 lbs/yr. A similar facility permitted in Wisconsin, but not constructed, had a limit of 0.00001 lbs/yr.
15. Will there be any smokestacks? No. Smokestacks are a component of direct combustion facilities like incinerators. There will be no direct combustion of MSW at this facility. As noted above, there will be exhaust stacks at a few locations for the combustion discharge from the turbines and the pyrolysis units.
16. How tall are the exhaust stacks? Will they be visible? Air quality testing is required to determine the height of the exhaust stacks. The actual site location and facility design is also necessary to determine stack height. Limited online research indicates that exhaust stacks from a pyrolysis unit will be approximately 1/3 the height of a comparable incinerator. These stacks will be located in the interior for the 11 acre lease, surrounded by forested buffer, and over 200 yards from the nearest property owner. They will be well screened from all directions.
17. What would a facility like this look like? The facility proposed for Stafford has not been designed yet, so an exact likeness is not available. A similar facility was recently commissioned in England, and is designed to produce 13 MWE (vs. 15 MWE in Stafford) from refuse derived fuel. The facility is enclosed similar to what is proposed for Stafford. The picture below is from the

facility in England. The link to this website is: <http://www.neattechnology.com/media-centre/press-releases/54-first-power-export-from-avonmouth-13mw-advanced-thermal-energy-recovery-facility/>



18. Why and how are tires used in the process? Tires are proposed as a high energy supplement to the MSW used in the process. MSW is variable in content, resulting in inconsistent British Thermal Unit (BTU) value. Processed tire waste is added to the MSW to provide more consistency and a higher BTU value. It is expected that the feed material will consist of approximately 30% tires. The tires are also received inside the facility, where they are shredded to remove the steel reinforcing. The steel is recycled, while the rubber mixed with MSW is then fed to the pyrolysis unit.
19. Will the introduction of tires into the process result in poorer air quality? No. The air discharge permit limits will be set at the same stringent levels with or without the addition of material from tires. The facility must demonstrate it will meet those limits prior to receiving an operational permit, and must operate in compliance with permitted limits. Failure to do so risks enforcement action from DEQ up to and including closure of the facility.
20. What about noise? All operations will be enclosed in a 120,000 square foot building. The gas powered electrical turbines produce the greatest amount of noise. They will be individually enclosed in a sound attenuating enclosure. The turbines will operate at about 94 decibels inside the building. This is less than the sound of a hand drill (98 db) or a lawn mower (107db). The site will be surrounded by several acres of forested buffer, and located in the interior portion of the landfill site. The noise generated by this facility, as observed at the border of R-Board property, will be miniscule. In addition, there will be a significant drop in current landfill MSW handling activities, decreasing net noise levels.
21. How large is the facility proposed at the landfill? EEP is proposing a 120,000 square foot facility on about 11 acres. The building, with access, parking, stormwater management, etc. will take occupy about 5 acres, with the balance of the area providing a buffer for the plant.
22. Who will pay for the cost of the facility? EEP is entirely responsible for the costs associated with the design, permitting, construction and operation of the WtE facility.

23. How many employees are necessary to operate the facility? EEP expects to hire a staff of 60 to operate the facility. This would include management, technical, operations and maintenance staff. No new R-Board employees will be required for this project.
24. When will the facility be in operation? EEP is scheduled to begin limited operation at the end of 2014.
25. How will the \$1 million payment be used? The \$1 million advance payment to the R-Board under the agreement has been proposed to help fund improvements to Eskimo Hill Road, estimated to cost \$7.35 million. The road currently handles the commercial waste haulers presently accessing the landfill on the narrow, winding road with no shoulders. Eskimo Hill Road was estimated to handle 3,200 vehicle trips per day (VPD) in 2010. Recent traffic analysis indicated 4,500 VPD on this road. The proposed facility would increase traffic on this road about 0.5%. The improvements to Eskimo Hill Road were proposed in the FY2013 CIP prior to discussion regarding this facility and are unrelated to traffic impacts related to it. The application of the \$1 million towards Eskimo Hill Road improvements, when matched with another \$1 million in revenue sharing funds from the state, would fund approximately 27% of the cost of this project.
26. Will there be increased user fees for Stafford and Fredericksburg citizens using the landfill because of this new facility? No. Current policy is that the R-Board does not charge residents for MSW they bring to the Eskimo Hill Road or Belman sites. With the approval of this facility, the present service levels are not expected to change. Charges to commercial haulers for residential waste are not expected to increase either. With the ever increasing environmental compliance costs related to the expanding landfill, this policy may have to change if we continue conventional landfill operations.
27. How will the operations at the landfill change as a result of this WtE facility?
- Operations at the landfill will change in a number of ways, some of which are noted below:
- Financially – the R-Board budget includes expenses of \$4,834,857, which is funded in part by an estimated \$3,200,000 in tipping fee revenues from commercial haulers, and \$405,000 from the sale of recyclable materials. Under this proposal, the R-Board would keep 100% of the tipping fee revenue and recyclable sales, while having landfill quantities reduced by 85%. The reduction of operation and maintenance costs from the vastly reduced landfill activity is estimated to be at least \$700,000.
 - Future Landfill Space – Reduction in landfill quantities of 85% will extend the life of the landfill indefinitely. Our recently opened cell will have a useful life of about 3 years before the next cell is constructed. This capital cost could be deferred about 18 years with the WtE operational. Once permitted landfill space is exhausted, the localities must identify another location to provide landfill service, or resort to more costly alternatives like landfilling or incineration at offsite locations. Identifying a new landfill location in Stafford County will be costly and face considerable public opposition.
 - Operations – Landfill waste deliveries will remain unchanged following the startup of the WtE facility, with the exception of the delivery of the estimated 3-4 truckloads of tires each day. Additionally, there will be a small increase in traffic due to the additional employees at the WtE facility, and the shipment of byproducts to markets offsite. Landfill activities will be greatly reduced, resulting in a reduction of equipment noise. The WtE facility will consume virtually all of the readily degradable waste, reducing odors from the landfill. Lighter waste products like paper and plastic will also be consumed by the WtE facility,

drastically reducing the problem of blowing waste.

28. How and when was the WtE project discussed? The project was advertised in the Free Lance-Star on October 4 & 5, 2012, when the R-Board solicited proposals from firms interested in offering innovative WtE projects. The R-Board then discussed this proposed project in open session on January 11, 2013, March 20, 2013, April 22, 2013, May 15, 2013, and June 19, 2013. In addition, the Stafford County Board of Supervisors advertised the proposed lease for the facility in the Free Lance-Star on May 28, 2013, in advance of the public hearing on June 4. The project was authorized for a public hearing on the lease at the May 7, 2013, open meeting.
29. Will the project have deleterious environmental impacts? No. The EPA and Virginia DEQ will closely monitor the emissions from this project. Pyrolysis is clean recovery of energy from common waste materials. There will be an exhaust port. That exhaust port will have multiple air pollution devices employed and the entire system will be monitored constantly by the VDEQ. If the plant is unable to operate within the guidelines and standards outlined by the EPA and VDEQ, it will be shut down.
30. Why can't the County develop solar power generation instead? A common misconception is that solar power is always a better alternative to provide electricity. Solar and wind power do not provide base load electricity. Virginia is also not in a good geographical zone to take advantage of solar or wind applications. There will of course be days that the wind blows substantially and there will be days that the sun shines all day long, but Virginia is not considered to be in one of the better locations for either as rated by the National Renewable Energy Laboratory (NREL). Neither wind or solar power generation addresses the issues related to solid waste generation and the costs and hazards related to that.
31. Is the technology behind pyrolysis advanced sufficiently to assure a successful project? Technology has advanced over the past decades. NEAT just put a 13MWh plant of similar technology on line in June of 2013 in Avonmouth, England. Waste materials do not need to be preserved for the next generation. Waste materials, including scrap tires need to be destructed, with the energy recovered to reduce our dependence on fossil fuels. This system does not produce toxic waste by-products that will be buried. All by-products such as char and oil will be consumed and further destructed in cement kilns where they will again reduce the dependence on additional fossil fuels in the cement manufacturing industry.
32. Other plants using earlier technology have failed. What will make this venture different? Technology has advanced since the failed plants of the 80's. The most recent plant to open is in Avonmouth, England to produce 13 MWe which went on line in June of 2013, consuming RDF in a similar manner as the system proposed for Stafford. In addition, technology advancements have made some of the early plants obsolete. Waste to energy is a developing industry.
33. The EPA defines pyrolysis by Regulations (4 CFR 60.51a) as being incineration. Why do you refer to the process as pyrolysis? The section of the EPA regulations cited above, CFR60.51a, is the section of EPA regulations defining which area this technology would be placed for air permitting purposes. EPA has done technical letters dating back to 2000 that state that pyrolysis is not incineration. Furthermore, the NREL recognizes this technology has a viable source of renewable energy. There will be exhaust ports to vent heat. It will resemble a smokestack but will not be emitting smoke. There will be advance air pollution controls and monitors in place to ensure that EPA and VDEQ standards are not in violation.

34. Doesn't the waste provided to a pyrolysis facility have to be homogeneous, meaning you cannot mix different types of garbage when you burn it? The waste required to operate a pyrolysis plant does not need to be homogenous. The operating range of the retort varies from 700 degrees F to 1400 degrees F. The approximately one hour duration in the retort allows for the endothermic destruction of all types of waste materials, including scrap tires combined in a heterogeneous mixture. Although using homogenous waste products is easier to accommodate with air pollution controls, technology has advanced to allow for a broader spectrum of air pollution controls to prevent the release of harmful emissions.
35. Won't this facility lower the recycling rates of other types of waste are the things that are normally recycled, like paper, wood, plastics, etc., setting up a conflict between recycling and this plant? The landfill currently has a state verified recycling rate of 49%. The landfill will continue current recycling practices without change. The proposed facility will include additional separation/recycling technologies to isolate recyclables from the waste stream provided by commercial haulers. This stream is currently deposited in the landfill. We strongly support the sensible recycling of items that have market value. Plastics, waste paper and wood normally have more value as a BTU supplier to our system.
36. If this technology is so effective, why isn't it in operation in the United States? The technology employed by EEP has not been implemented in the USA because many states do not have WtE certified as a renewable source of power. This has changed recently with over 25+ states now recognizing Waste to Energy as a renewable energy, so power companies have a desire to purchase the power. Unlike wind and solar Waste to Energy is base power and allows power companies more effective ways to manage the power load. So it is in competition with wind and solar now. Also, the USA has adequate land mass to allow for the continued burial of waste materials, and access to fossil fuel resources to generate power for the nation. Solar and wind are good sources of renewable energy, but the State of Virginia is not in a Zone that would make it conducive to dependence on solar and wind sources unless advancements are discovered in the realm of storing energy.
37. Identify some benefits of this facility. Extend the life of the landfill, avoid burial of waste materials in the ground, reduce dependence on fossil fuels, create 60 local jobs, inject \$3 million dollar payroll into the community, reduce greenhouse gasses, produce baseload renewable electricity that is available regardless of the time of day or weather conditions.
38. Are the byproducts toxic, and will they harm the environment if placed back in the landfill? The by-products are not toxic and do not present a danger if they were taken back to the landfill. In fact the char is qualified to be a landfill cover or soil amendment as testified by National Renewable Energy Lab. EEP proposes to sell the oil and char derived from the process as either a soil amendment or as a BTU source for other industries, such as cement kilns. The char and oil are a revenue source for the project. EEP will analyze the char during the testing phase, and the results will be provided to VDEQ.
39. Does the agreement with the R-Board allow an unlimited amount of tires and other external waste to be brought into the plant? No. EEP plans to utilize 90-100 tons of scrap tires per day. The draft lease under consideration limits the quantity of scrap tires, and completely prohibits outside MSW. This facility will also process the roughly 90,000 scrap tires currently delivered to the landfill and

disposed of at a cost of about \$71,000 per year. Any waste items beyond the current MSW stream and scrap tires must be authorized by the R-Board.

40. Will this facility increase or decrease hazardous materials in the landfill? The by-products produced by the facility are not toxic and do not present a danger if they were taken back to the landfill. Currently, all waste materials delivered by commercial haulers and residents and delivered to the MSW drop off bins or on the landfill cell are buried, without sorting. Hazardous materials hidden in the trash would be discovered and removed with the EEP system. The facility would lower the amount of hazardous materials buried in the landfill.
41. Will this facility increase the truck traffic to the dump, causing an estimated \$7.4 million in improvements to Eskimo Hill Road? No. Truck traffic will increase by a maximum of 10 inbound and 10 outbound trucks. In addition, there will be some increase in regular vehicular traffic as a result of the additional employees. Current traffic counts on this road are between 3,200 and 4,500 vehicles per day. The net increase as a result of this facility is less than ½%. The R-Board saw this revenue stream as an opportunity to match with \$1 million in state Revenue Sharing Funds to accelerate a much needed road improvement. The proposed facility is not creating the need for the road improvement, but providing an opportunity to fund it.
42. Will this facility increase greenhouse gas emissions and accelerate climate change? The environmental assessment completed in support of the Green Bay, Wisconsin project concluded that: “Since approximately 11 percent of the MSW now going to the regional landfill would be diverted to the proposed project (Section 3.2.6.2 of this EA), there would be a reduction in the amount of the MSW decomposition at the landfill and, therefore, a reduction in the associated GHG emissions. DOE evaluated the quantities of GHG emissions that could be avoided at the landfill, and estimates that the *reduced amount of gas going to the engine generator sets and being released to the atmosphere would result in avoidance of 4,000 to 5,000 tons per year of CO_{2e} emissions*” (emphasis added). In addition, the EPA website carbon credit tool calculates that EEP would be eligible for 135,000 carbon credits by processing them versus burial in a landfill.
43. Wouldn’t it be better to maintain current operations at the landfill? Doing nothing will perpetuate the status quo. The landfill will continue to bury the waste materials without recovering the bulk of the hazardous materials. Although the landfill is well designed and maintained, those hazardous materials and the decomposing MSW will be encased in the ground and situated above the water aquifer. As they decompose, they will create landfill methane. Waste to Energy projects such as EEP can actually reduce the volume of greenhouse gasses produced from landfill operations. Eventually, the current landfill will exhaust available space, requiring the City and County to locate a new site for a landfill. Acting now will preserve the current landfill site for the foreseeable future.
44. Can you identify locations where pyrolysis and gasification technology is being used? The following list was prepared by the Department of Energy to support the Environmental Assessment for the facility in Green Bay, Wisconsin. There may be other examples commissioned since this list was prepared, such as the facility in Avenmouth, England.

Pyrolysis/Gasification Technology Around the World

Facility/Supplier Name	Location	Country	Capacity	Primary Feedstock	Syngas/Waste Heat Utilization
Cleveland Public Power- MSWE Plant/ Princeton Environmental Group	Cleveland, OH (Preconstruction stages)	USA	900-1,500 TPD	MSW	Boiler- 20 MW
Conrad Industries	Chehalis, WA	USA		Plastics	
Graveson Energy Management	Summit, NJ	USA		MSW	
North American Power Company	Las Vegas, NV			MSW, industrial, medical, plastic	Boiler
Pan American Resources, Inc.	Pleasanton, CA			MSW	
LACDPW/ International Environmental Solutions	Riverside, CA (Preconstruction stages)	USA	180 TPD (pilot)	MSW	
Waste Gen UK Ltd	Gloucester	UK	110,000 TPY	MSW	Boiler
Utility Savings & Refund, LLC	Newport Beach, CA	USA	150 TPD	carbon-based material	BioOil
Global Energy Solutions, Inc. Sarasota, FL	Claims 4 plants in operation around the world			MSW	Boiler
Interstate Waste Technologies Malvern, PA	3 Plants: Italy- 100 TPD, Japan- 330 TPD, Germany- 792 TPD		289,000 TPY	MSW	Boiler/IC
Compact Power Holdings PLC/Compact Power Ltd.	Avonmouth	UK	8,000 TPY	MSW- Special wastes, mainly clinical medical waste	Boiler
Mitsui Babcock - R-21	Toyohashi City	Japan	400 TPD	MSW	8.7 MW
	Koga Seibu		260 TPD	MSW; Sewage Sludge	4.5 MW
	Yame Seibu		220 TPD	MSW	2.0 MW
	Nishiiburi		210 TPD	MSW	2.0 MW
	Ebetsui City		140 TPD	MSW	2.0 MW
	Kyoboku Regional		160 TPD	MSW	1.5 MW
WasteGen/Techtrade	Hamm	Germany	353 TPD	MSW; Sewage Sludge	power generation
	Burgau	Germany	154 TPD	MSW; Sewage Sludge	power generation

Appendix D

Facility/Supplier Name	Location	Country	Capacity	Primary Feedstock	Syngas/Waste Heat Utilization
Thide Environment	Arras	France	40,000 TPY	Household Wastes	Industrial Stream
	Dreux	Paris	6,400 TPY (pilot)	MSW, Industrial Waste, & sludge	
	Izumo	Japan	70,000 TPY		
	Itoigawa	Japan	25,000 TPY		
	Nakaminato	Japan	8,000 TPY		
IET Energy/ Entech Renewable Energy System		Singapore	72 TPD	Food Processing Wastes	4.0 MWt (Steam)
		Korea	60 TPD	MSW	power generation
		Korea	30 TPD	MSW	power generation
		Hong Kong	58 TPD	MSW	power generation
	Genting/Sri Layang	Malaysia	60 TPD	MSW (WDF)	6.9 MWt
	P.N.G.		40 TPD	MSW	syngas
	Chung Gung Municipality	Taiwan	30 TPD	MSW	2.3 MWt (steam)
		Australia	15 TPD	MSW (WDF)	power generation
		Indonesia	15 TPD	MSW (WDF)	power generation
	Freiberg	Germany		Waste w/ high aluminum/plastic content	Aluminum briquettes, inert glass granulates, syngas
Compact Power Holdings PLC/Compact Power Ltd.	Bristol	UK	9,000 TPY	Clinical & Special Waste	Heat for Autoclave
Ensyn	Renfrew	Ontario, Canada		Residual Wood	Fuel oil replacement
Siemens (Formerly Future Energy GmbH and Noell)	Freiberg	Germany		Coal/low-grade fuels (facility can also take waste)	Power generation (3-5 MWth), chemicals, synthetic fuels
Thermoselect	Chilba	Japan	100,000 TPY	Industrial Waste	
	Mutsu	Japan	50,000 TPY	MSW	

Compiled by DOE Golden Field Office during work conducted on the Draft Environmental Assessment for Oneida Seven Generations Corporation: Energy Recovery Project, Green Bay, Wisconsin (DOE/EA-1862).

MSW= municipal solid waste.

tpd= tons per day.

tpy= tons per year.